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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/814,264 | 04/01/2004 | Jong Jin Park | 021269-013 | 8445 |

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| EXAMINER | |
|---|---|
| DICKEY, THOMAS L | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2826 | |

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/814,264 | PARK ET AL. | |
| | Examiner | Art Unit | |
| | Thomas L. Dickey | 2826 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-21 and 23* is/are pending in the application.

4a) Of the above claim(s) *1-15 and 23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-18* is/are rejected.

7)☒ Claim(s) *19-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

# DETAILED ACTION

## *Continued Examination Under 37 CFR 1.114*

**1.** A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/01/2006 has been entered.

## *Claim Rejections - 35 USC § 103*

**2.** The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over ALIVISATOS ET AL. (2005/0054004) in view of WANG (2003/0180665).

Alivisatos et al. discloses a method for forming a semiconductor nanocrystal pattern on a substrate (such as a 3-4 nm thick film of amorphous carbon, note paragraph 0084), comprising the steps of a) dispersing CdS, CdSe, ZnS, or ZnSe (note, e.g., paragraph 0008) (although many types of semiconductor

nanocrystals may be used, note paragraph 0056) semiconductor nanocrystals in an organic solvent (such as chloroform, toluene, or tetrahydrofuran, note paragraphs 0075 and 0084) and coating the dispersion onto the substrate by, for example, spin coating, dip coating, spray coating or blade coating; wherein said semiconductor nanocrystals are surface coordinated (note paragraph 0057) with phosphine oxide (a compound containing a photosensitive functional group. Note, paragraph 0100, that the phosphine oxide coated nanocrystals are sensitive to a process Alivisatos et al. call "photoannealing"); b) evaporating (note, again, paragraph 0084) said organic solvent to form a film on said substrate of said semiconductor nanocrystals surface coordinated with said phosphine oxide (photosensitive compound); b') drying said film at 30-100 (note paragraphs 0072-0073) degrees C. Note figure 7 and paragraphs 0008-0013; 019; 0054-0057; 0068-0079; and 0095-0107 of Alivisatos et al.

Alivisatos et al. does not disclose the steps of c) selectively exposing said film to light through a mask wherein a cross linking reaction takes place resulting in a solubility difference between exposed and unexposed areas; and d) developing the exposed film with the use of an organic solvent, a weakly acid or basic solution, or water. However, Wang discloses a method for producing multiple objects on a single substrate 101 comprising the steps of selectively exposing a film 100 to light (X-rays or ultra short UV) through a mask 104 wherein a cross linking reaction takes place resulting in a solubility difference between exposed 106 and unexposed 100 areas; and then developing (arrow 105) the exposed

106 film using acetone (an organic solvent) Note figures 3a-c and paragraphs 0150-0179 of Wang. Many contemporaries of Alivisatos et al. and Wang have suggested advantages accruing from the use of techniques involving photo-patterning and subsequently developing cross-linkable polymers. For example Bai et al. 2004/ 0222412 suggest the use of such a technique could be used to produce such varied electronic devices as field-effect thin film transistors, capacitors, embedded capacitors or electroluminescent lamps, and would be useful in patterning organic polymer semiconductors or inorganic semiconductors such as, for example, amorphous Si, CdS, or CdSe. Bai et al. go on to say that crosslinkable polymers are particularly desirable in that they provide flexibility in manufacturing methods, would easily integrate with solution processed device layers, and could allow for high-speed roll-to-roll processing. Note paragraphs 0031-0038 of Bai et al.

Therefore, it would have been obvious to a person having skill in the art to augment Alivisatos et al.'s method with the steps of selectively exposing said film to light through a mask wherein a cross linking reaction takes place resulting in a solubility difference between exposed and unexposed areas; and developing the exposed film with the use of an organic solvent, such as taught by Wang, in order to produce multiple objects on a single substrate to thus provide a patterning method that provides flexibility in manufacturing methods, easily integrates with solution processed device layers, and could allow for high-speed roll-to-roll processing.

### *Response to Arguments*

**3.** Applicant's arguments with respect to claims 16-18 have been considered but are moot in view of the new ground(s) of rejection.

### *Allowable Subject Matter*

**4.** Claims 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

**5.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Thomas L. Dickey**
**Primary Examiner**
**Art Unit 2826**